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Reply to Office Action of November 15, 2004

core. The Examiner contends that it would have been obvious, in view of the Kent reference, to use a reclaimed polypropylene material as the core component in the Taylor process.

Applicant respectfully submits that the present invention would not have been *prima facie* obvious in light of the cited references. Therefore, this rejection is respectfully traversed.

As the standard for assessing obviousness, MPEP 706.02(j) lists the three requirements for establishing a *prima facie* case of obviousness under 35 U.S.C. § 103:

First, there must be some suggestion or motivation, either in the reference itself or in the knowledge generally available to one of ordinary skill in the art, to modify the reference to arrive at the claimed invention.

Second, there must be a reasonable expectation of success.

Finally, the prior art references must teach or suggest all of the limitations.

Importantly, it is only after the Examiner has satisfied the burden of demonstrating a *prima facie* case of obviousness that the patent applicant must come forth with proof demonstrating patentability over the prior art. It is respectfully submitted that these three requirements have not been met and, therefore, a *prima facie* case of obviousness has not been established.

#### *The Prior Art Does Not Teach All of the Claimed Limitations*

The Taylor reference discloses a process for producing spunbond nonwoven fabric, but as the Examiner recognizes, there is no disclosure or suggestion of using reclaimed polypropylene at all, and certainly no disclosure or suggestion of incorporating up to 100% reclaimed polypropylene in the core component of a sheath core cross-section filament.

The Kent reference is not concerned with producing a spunbond nonwoven fabric. Rather, Kent is directed to an entirely different technology -- producing carpet yarn. In the production of carpet yarn, a fiber-forming thermoplastic polymer, in this case nylon 6, is melted and extruded through a spinneret. The extruded fibers are quenched with air, treated with a lubricating oil finish, combined to form a yarn bundle, and then wound up. In a subsequent step, the yarn is drawn and texturized to form bulked continuous fiber yarn suitable for tufting into carpets. According to the Kent invention, sheath core fibers are produced which have a

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polyamide sheath domain and a core domain formed of polyamide (nylon 6) containing relatively high levels of contaminants.

The Kent teaching is specifically with reference to carpet yarns and to a specific condensation polymer, nylon 6. The Kent reference does not contain any teaching or suggestion with regard to reclaimed polypropylene. Nor does Kent contain any teaching with regard to bicomponent filaments of a spunbond nonwoven fabric. It certainly contains no teaching or suggestion of providing reclaimed polypropylene in the core of a sheath core filament of a spunbond nonwoven fabric.

Therefore, it is clear that neither Taylor nor Kent, nor any combination of these two patents, teach all of the limitations of the invention as claimed in independent claim 1, or in the other claims of record.

The subject matter of the claimed invention can only be arrived at from the Taylor and Kent references through a rather substantial extrapolation of the reference teachings. It is necessary to stretch or extend the Kent teachings, which as noted earlier are for a specific polymer (nylon 6) and for a specific technology (carpet yarn production), and to conclude that the teachings are of universal applicability and readily transferable to any virtually any polymer and to virtually any other kind of fiber spinning technology. There are untold numbers of different fiber-forming polymers, and there are also a large number of distinctly different fiber spinning technologies. The Examiner has put forth no cogent reasons why it is reasonable to expect that the Kent teachings would be applicable to all polymers and to all fiber spinning technologies in general, or to polypropylene in a bicomponent spunbond process in particular.

*There is no suggestion or motivation to modify the references*

The process used by Kent for producing carpet yarn is fundamentally different from a spunbond nonwoven fabric process such as that described in the Taylor reference. Among the significant differences are the following:

- Kent produces carpet yarn, not a spunbond nonwoven fabric.
- In the Kent process, individual filaments are extruded, quenched, combined into a yarn, and wound up. The yarn is subsequently unwound, drawn and texturized. In a spunbond

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process such as that of Taylor, individual filaments are extruded into a quench chamber, pneumatically drawn and attenuated, deposited onto a collection surface to form a web, and subsequently bonded, all in a continuous operation. The filaments remain separate from one another and are never combined into a yarn.

- The carpet yarn contains 58 filaments. (Kent example 1). The nonwoven fabric contains thousands of filaments, e.g. 3000-6000 per meter of width (Taylor Col. 3 lines 30-34).
- Filaments of a carpet yarn are considerably larger than filaments in a spunbond nonwoven fabric. Kent states that carpet fibers are preferably from about 15-28 dpf. By contrast, the filaments of a spunbond nonwoven web are considerably finer, on the order of up to about 3 dpf.
- The spinning speeds of a spunbond process are greater than those used in the manufacture of carpet yarn.
- Kent is dealing with a condensation polymer, a polyamide, namely nylon 6. The Taylor reference uses a polyolefin addition polymer, namely polypropylene.

Because of the fundamental differences between a spunbond process and a carpet yarn process, as outlined above, persons of skill in the art who are familiar with spunbond technology would not consider carpet yarn technology to be an analogous art. Furthermore, persons skilled in the art would not have any reason to expect that a technology that can be successfully employed in carpet yarn production could be translated to a process for manufacturing spunbond nonwoven fabric.

In the spunbond process, because the filaments are relatively fine and are attenuated pneumatically in a continuous operation, breakage of individual filaments in the attenuation and filament deposition step can have serious undesirable consequences. Any individual filaments that break can wrap around the rolls used to compress the web as it travels along the belt, or they can wrap around the calender rolls used for bonding the filaments of the web (See the rolls 44 in Figure 1). Such filament wraps are a significant problem and require shutting down the entire spunbond line so that the filament wraps can be manually removed from the rolls. Even if a broken filament does not form a filament wrap, it will produce a defect in the spunbond

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nonwoven fabric. These problems are well known to persons of ordinary skill in the art of producing spunbond nonwoven fabrics.

The problem of filament breakage is not as severe in a carpet yarn process, since the individual filaments are consolidated into a yarn, and thus an individual broken filament would simply be carried along with the other unbroken filaments of the yarn without disrupting the process. In addition, the filaments of a carpet yarn are typically much larger in diameter than the filaments of a spunbond nonwoven web, lessening the filaments breakage issue. Also, the larger filament size contributes to the ability to incorporate contaminants into the core. While it might be possible to incorporate significant quantities of contaminants in the core component of a bicomponent nylon 6 carpet yarn filament, as taught by Kent, persons of ordinary skill in the art of producing spunbond nonwoven fabrics, who are aware of the fundamental differences between the processes and the problems outlined above that are specific to the spunbond process, would not consider the Kent teachings to be translatable to the production of polypropylene filaments in a spunbond nonwoven process. There are simply too many differences in the processes and in the behavior of the different polymers. For these reasons, the person of ordinary skill in spunbond nonwovens technology would not consider the carpet yarn technology as being an analogous art.

Therefore, the proposed combination of the Taylor and Kent references lacks the necessary motivation required to establish a *prima facie* case of obviousness.

#### *No Expectation of Success*

As explained more fully above, the ordinarily skilled worker in producing spunbond nonwoven fabric, being aware of the specific problems encountered in a spunbond process, such as filament breakage for example, would have no reason to expect that reclaimed polypropylene could be incorporated into the core of the filaments of a spunbond nonwoven fabric. The fact that a contaminant-containing material may have been successfully incorporated into the core of a carpet yarn, as taught by Kent, says nothing about whether this could be successfully implemented in a spunbond process. For this reason, the rejection also lacks the second requisite of establishing a *prima facie* case of obviousness.

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*The use of hindsight is improper*

The Taylor and Kent references themselves contain no specific teachings that would incite someone to modify the Taylor process so that reclaimed polypropylene is present in the core of the filaments. Applicant has shown above that the person of ordinary skill in the art would not, either from the reference itself or from the knowledge generally available to one of ordinary skill, be motivated to make this modification, and moreover, this person of ordinary skill would have no reasonable expectation of success.

Assuming that there were some reasonable motivation for modifying the Taylor process in light in the Kent teachings, this modification should lead to placing Kent's contaminant containing nylon 6 polymer into the core of the Taylor bicomponent filaments. However, in order to arrive at applicant's claimed invention, it is necessary to take Kent's specific teaching with respect to nylon 6 and to apply it to an entirely different polymer - polypropylene.

From the foregoing, it should be evident that a hindsight reliance upon applicant's own disclosure is the only conceivable basis why one would combine the Taylor and Kent references in the manner set forth in the rejection. This is not a proper basis for an obviousness rejection.

*Conclusion*

Applicant has clearly shown that the requirements for establishing a *prime facie* case of obviousness under 35 U.S.C. §103 have not been met. Accordingly, the obviousness rejection should be withdrawn.

Favorable reconsideration by the Examiner and formal notification of the allowability of Claims 1 and 4-10 are earnestly solicited.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper.